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ABSTRACT

This report discusses research commissioned by the Corporation for Public Broadcasting in order to evaluate prototypes of digital public television programming. There were two phases of research, the first using exclusively linear demonstrations of interactive public television, and the second demonstrating computer simulations of three digital programs. The primary goal of the research was to formulate models for successful interactive public television using available linear and computer-based prototypes. Since these prototypes are designed to demonstrate potential interactive techniques and not to be aired as they are, this report concentrates more on the general findings from reactions to the clips rather than diagnosing weaknesses. Following an outline of key findings, detailed findings are discussed in terms of expectations for the future of television, attitudes toward public television as an interactive leader, general reactions to interactivity, and interface issues. Suggestions for developing models for interactive programming are offered. (AEF)

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Research Notes

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Will Public TV Viewers Want Interactivity?

Results of the Digital Prototype Study

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As television advances into the digital future, will the viewing experience be changed by computer-like interactivity? While we cannot predict if or how computers and television sets may converge in the future, an important question is how viewers will use *public television content* with interactive enhancements for entertainment and education. The Corporation for Public Broadcasting commissioned ASI Entertainment to evaluate prototypes of digital public television programming. There were two phases of research, the first using exclusively linear demonstrations of interactive public television, and the second demonstrating computer simulations of three digital programs.[1]

It is important for users of this report to understand the limitations of the study. As with any qualitative research, it is inappropriate to assume that the numeric results of this study are projectable to the population at large. However, experience has shown that focus groups are excellent tools for understanding the public's thought processes.

Key Findings

The primary goal of this research is to formulate models for successful interactive public television using available linear and computer-based prototypes. Since these prototypes are designed to demonstrate potential interactive techniques and not to be aired as they are, this report concentrates more on the general findings from reactions to the clips rather than diagnosing weaknesses. It should also be noted that the demonstration only shows potential interactive applications for digital television, and not higher resolution, multiple, unrelated streams of programming or other uses.

- *Viewers are intrigued by the potential of interactive television.* Both older public television viewers who tend to be less computer-savvy and the younger and more

[1] In the first phase a total of 49 respondents viewed linear prototypes which were video demonstrations of interactive programs in Los Angeles and Baltimore; in the second phase a total of 59 respondents viewed linear prototypes and interacted with hands-on computer simulations of interactive television in Denver and Bethesda, Maryland.

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computer literate group members find interactivity enhances their viewing experiences.

- *Almost everyone in our groups wants interactive television.* They see it as a natural evolution of television and as a potential merger of the information-rich, but hard to enjoy, Internet with television. They feel that having interactive television would change the way they use the medium, although it is hard to say at this time what changes will occur.

- *The primary appeals of interactive television are the ability to get more information about the subject of the program and the ability to control the flow of the program.*

- *Viewers believe that programming types to be most enhanced by interactivity are information-based, whether educational, live news or recorded documentaries.* Little desire for interactive versions of traditional entertainment television programs is apparent. Viewers see minimal potential benefit to interactive comedies or dramas, and a significant potential for distraction or a reduction in the quality of the program. Interactivity is also not perceived to be valuable for "light" programming which tends to be viewed while doing other things.

- *Experienced computer-users are more enthusiastic about the value of interactivity.* They immediately understand the purpose of the enhancements and make suggestions for additional ways interactivity could be used. This affinity makes it possible that well-produced interactive material has the potential to broaden public television's core audience to include younger, computer-savvy, information seeking viewers.

- *There is no evidence from this study that people will watch a program that does not interest them solely because of interactivity.* There is evidence that interactivity can serve as a "tie-breaker," causing a program to be selected when it is roughly equal in appeal to linear programs on at the same time.

- *The older viewers exhibit little hesitation with or discomfort from experiencing programs with interactivity.* For example, one 61-year-old woman made the following comment after seeing the *Great Performances* tape, "*The idea of interactivity is so interesting in itself that I think it will be accepted by all ages.*" There is no sense from older viewers that the interactivity would be more for younger people.

- *Many viewers consider consistency of interface functionality critical.* They want to spend their time experiencing the program's content, rather than learning how to use it. Therefore, they desire a standard set of options that will perform routine tasks, such as getting back one level, getting back to the linear program, pausing the program and seeing the cursor change form or color when on an interactive area.

- *In these demonstrations, viewers do not like large amounts of text on the screen.* As a rule, textual information is often deemed unreadable by many of the respondents, even those sitting relatively close to the sets. This may be a problem with font sizes,

spacing between letters and lines, interlaced sets or the respondents' vision. In addition, people describe text as requiring too much effort to read and as distracting them from the flow of the program.

- *Given the way television is currently used, most viewers say they believe interactive television will be a solitary experience.* When one person has control of the interaction, other people in the room find the interactions to be bothersome.[2] In the groups of pairs of people who watch television together, the person without the trackball said the other person was always clicking too soon, too late or on the wrong thing. This research suggests that a significantly different paradigm will be necessary to make interactive television a group experience.

- *While it is clear that certain uses of interactive television are beneficial, a number of viewers find some of the interactivity distracting and say they would be less likely to watch a program if it had that kind of interactivity.* In general, interactivity that diverts attention from the linear program is considered too distracting.

- *Public television has the potential for leadership in interactivity.* There is little doubt that many public television programs are perceived to be excellent candidates for interactivity

- *Group members are left with many questions about interactive television.* They want to know how it will happen, when it will be available, what kind of equipment they will need, which programs will be interactive and how much it will cost. They expect clear answers to these basic questions before being able to make intelligent decisions about whether to purchase the hardware, pay service fees for the software or use interactive television.

Detailed Findings

Expectations for the Future of Television

People have given very little thought to the future of television and what will be different in the future. At this point, most people know very little about the capabilities of digital technology so there is no substantial interest in HDTV, DTV, widescreen, interactive or any other kind of enhanced television. For those in areas served by digital cable or who have considered Ku satellite dishes, the only substantial benefits are additional channel capacity, marginally better pictures and an enhanced program guide. While many people have heard about digital television, they know of little benefit for them personally.

When asked to predict what television might become in the future, a few people describe interactivity, primarily in some kind of Internet-based model. However, few people expect that the computer and television will merge. Adults primarily use computers to

[2] In Phase 2, two of the groups were designed to test viewing in pairs. Respondents were recruited with an adult with whom they ordinarily watched television.

complete tasks or to find specific information, while television is viewed as an entertaining medium.

This relatively "blank slate" in terms of viewer expectations provides marketers with an opportunity to define the future of television as they desire.

Attitudes Toward Public Television As An Interactive Leader

Viewers do not have strong feelings about public television as a natural leader in interactive television. Pledge drives have made people believe the public television system does not have great financial resources, and therefore could not afford interactive television. However, when people are told that public television is taking the lead with the demonstrations, there are almost universally positive reactions. The following are some quotations that describe people's attitudes toward public television and interactivity:

"I'm proud of them (PBS) for taking the lead on this"

"It will give them more power if PBS does it."

"PBS should do it."

"It goes with their format."

"It [interactivity] might make me turn it [PBS] on."

"It enhances public television. I expect it from them."

"PBS is obviously educational already. Interactive will only help it be more."

"I trust them [PBS]. If I turn my back and leave the set on, I know my kids will be safe."

"This is pioneering a whole new thing. This is going to change the way we watch TV."

General Reactions To Interactivity

After seeing the demonstrations, viewers like the idea of interactivity a great deal. They are genuinely interested in knowing the mechanics of interactive television and in being able to have it. The main benefits they see from interactivity are:

- **Control**. Viewers feel that interactivity lets them decide what they want to see and how much information they get about a particular topic. They also feel that interactivity should allow them to fast forward through less interesting portions of a program.

- **Additional Information**. At the most basic level, people want interactivity to provide more detail. This may be because of interest in the topic (as was displayed in the demonstrations) or because they want to use the information. Many people mention how-to programs as being perfect for interactivity because of the additional detail they could use.
- **Richer Viewing Experience**. Interactive programs are perceived to be more engaging and could make television a different and more pleasurable experience by the immersion.
- **Better Education**. Almost everyone who sees interactive television has a vision of formal and informal educational uses of this technology.

There are also a number of potential negative impacts of interactivity that people describe while watching the interactive demonstrations:

- **Distraction**. This is the most significant complaint and is something that most people feel is a problem during some of the demonstrations. It appears to be very difficult for most people to concentrate on two disparate information streams at one time. When exposed to text on voice or interruptions in the middle of content, they seem to lose focus and get little from either stream of information.
- **Weak Underlying Programs**. Viewers express the fear that producers will spend too much time and energy on the interactive material and will reduce the quality of the basic program they want to see.
- **Difficult Interfaces**. Once people decide they want to interact, they get frustrated when the interactions do not occur the way they would like them to. They want the flexibility to be able to use the program as they wish, and not necessarily following a single pattern.
- **Makes Television Too Much Work**. There is a fear that complicated interactivity will make the television too much like a computer. Computers crash, require programming and training and are always becoming outdated. None of these are significant issues with televisions. Viewers want to be able to put on the set, use their remote control and find programs of interest with ease.

There is a tremendous upside to interactivity in attracting viewers to public television programs. After each linear or computer simulation program, viewers were asked to privately rate the impact of the interactivity on their interest in watching the program. People are enthusiastic about the value of interactivity with many more people saying the interactivity will increase, rather than decrease, their likelihood of watching the program.

Interface Issues

Viewers have a number of expectations from an interactive user interface. Their goal is to be able to experience the interactive content with as little trial and error as possible. They want an interface that allows common functions to be performed in the same way across programs. This includes getting an indication of which elements are interactive

(like on the web where the arrow changes to a hand when pointing to hotlinks), a universal way to get back to the main program and a universal way to get back to the previous content. The similarity between these functions and typical web browser functions is not a coincidence; viewers immediately compare the interface to browsers and expect all those functions to be available.

There is also a need for on-screen and audio instructions and guides to help people know how to best experience the program. The remote control needs to be simple. There is a fear that interactive television could be subject to the same forces that leave many VCRs blinking "12:00." Having a few buttons with simple functions is critical to making the technology approachable.

In terms of hardware, viewers have a number of requests. Many people are interested in having a printer, particularly for how-to programs. People feel it is important to be able to stop the main linear program in order to take advantage of the interactive content at their own pace. This suggests that a significant amount of storage needs to be available to cache the program. Finally, there is a clear need for storage of the interactive content in order to access it after the program or at different times.

After each of the interactive programs, people were asked if anything confused them. Between twenty and thirty percent say they were confused with each of the programs. The most common problems were:

- A lack of clear on-screen directions
- Uncertain how to get back to the main program
- Lack of integration between the program and the interactivity
- They had to use different commands for the same task in different programs
- Bugs (non-functioning options, linear content that went back to the beginning instead of continuing where it left off).

Recommendations

Based on this research, and our experience with digital television, the following are suggestions for developing models for interactive programming:

- Interactive public television should provide streams of information that enhance the experience with the underlying program. Appropriate interactivity can make attractive programs.
- In this test, the most enjoyable interactive elements are generally the least complex. This suggests a learning period where viewers begin to use minimal interactivity as enhancements to a linear program and potentially migrate to true interactive "journeys" over time.

- Care must be taken to ensure that the linear viewing experience is not diminished by the interactive elements. Producers should understand that, at any given time, a relatively small proportion of a program's audience is likely to be interacting.
- The program must always progress in an interesting and entertaining way since a portion of viewers may not desire to interact.
- A standard interface should be used to minimize confusion and allow the largest proportion of viewers to effortlessly access interactive services. This interface need not limit producers' creativity, but should assure that standard functions are performed in standard ways.
- Simplicity is important to viewers. When presented with too many choices, they become less interactive than if they have limited (one or two) options.
- Viewers should be guided through the interactive content. While some people express an interest in experimenting to find out what content is in the interactive portion, many people would prefer to be taken quickly to content of interest.
- Text-based information may be a significant problem for many viewers to read at the distances they typically sit from their television screens.
- Public television is well-positioned to be a leader in digital television if it can successfully make the case of why it is doing so, that it can afford to do so and how the viewer will benefit. As with many entertainment businesses, public television will have to use substantial marketing to tell the viewers why interactive television is such a benefit for them.

Methodology

Phase 1

Two viewing sessions were held at ASI Entertainment's AllMedia Center in Glendale, California, on December 3, 1998, and two in Baltimore on December 8, 1998. There were 49 respondents, split roughly equally by location, gender and age (one-half younger than 40; the other one-half 40 and older). The younger participants were selected to be viewers of information-based television programming, whether on public television or cable. The older participants were all medium to heavy public television viewers.

Phase 2

Phase 2 consisted of eight groups. Four were conducted in Bethesda on February 10-11, 1999, and four in Denver on February 17-18, 1999. There were a total of 59 respondents, of which 35 were single individuals and 24 were in pairs of people who usually watch television together in the evening. All respondents were medium to heavy adult public television viewers and were comfortable using a mouse. As with Phase 1, respondents were split roughly equally by location, gender and age (one-half younger than 40; the other one-half 40 and older).

Method

Upon arrival at the facility, participants were re-screened and filled out a short questionnaire that asked about their viewing of a number of cable and broadcast channels as well as their familiarity with computers. In Phase 1, the respondents then entered the viewing room, were briefed on the use of the dials and the nature of the videotape demonstration they were about to see and watched the segments. In Phase 2, they saw a video presentation of the Itzak Perlman program and were briefed on the use of the computer simulations. Respondents spent about 15 minutes on each simulation. Immediately after each linear or computer presentation, the respondents filled out a short questionnaire covering likes and dislikes about the program and the interactivity that was portrayed. The respondents then participated in a group discussion that explored their underlying attitudes about what they saw.

The test process utilizes three distinctly different types of responses:

> ***ASIE's Instantaneous Response Dials:*** All respondents in Phase 1 provided second-by-second responses to the program by means of hand-held dial devices. In addition to providing feelings about the program, respondents used a button on the hand-held device to signify any areas of confusion.
>
> ***Questionnaires:*** After viewing each segment, all participants recorded their reactions to the program overall and to its interactivity. While these questionnaires provide information, any quantitative use of data from 49 people is inappropriate. This information supplements those from the other techniques.
>
> ***Focus Groups:*** After seeing the program, respondents participated in focus group discussions exploring, in depth, their feelings toward the program and the interactivity.
>
> This report integrates responses from all techniques.

The stimulus material for the study consisted of early demonstrations, and did not have the polish or sophistication of future programs. In addition, the range of material tested was relatively narrow, all the programs were documentaries or performance-based.

If you have questions about these data, please contact Janice Jones at (202) 879-9677 or by e-mail jjones@cpb.org. We also welcome any comments or suggestions about how to make the data more useful to you.